Title

Polarized Electron Beams In The MEIC Collider Ring At JLab*

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Abstract

The nuclear physics program of the Medium-energy Electron-Ion Collider (MEIC) at the JLab requires a highly-polarized (over 80%) electron beam with longitudinal polarization at the collision points. This can be achieved by arranging the equilibrium polarization direction to be vertical in the arcs of the figure-8 shape ring and longitudinal at collision points. The rotation of the polarization is accomplished by using energy-independent universal spin rotators, each of which consists of a set of solenoids and dipoles placed at the end of each arc. To reduce the spin-orbit depolarization effect due to the synchrotron radiation, spin matching to make the rotators and interaction regions spin transparent must be applied. We present the current universal spin rotator design and its layout, address various coupling compensation schemes for the solenoids, estimate the beam polarization lifetime from spin tracking simulation using the code SLICK and explore how issues related to spin matching influence the design of the ring.

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